HIGH 86 LOW 74
Cloudy with showers likely
Weather, D-18

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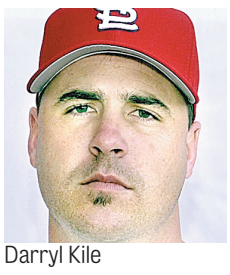
SPORTS



Darryl Kile

BLOCKED ARTERY LIKELY KILLED ST. LOUIS PITCHER

LIVING

COLUMNIST REMEMBERED

Landers wanted to help the world, loved ones say

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Wildfires merge into a monster

Inferno in Arizona nears a ghost town

By Foster Klug
Associated Press writer

SHOW LOW, ARIZ. — Two wildfires raging unchecked through paper-dry forest merged Sunday into a single blaze of about 300,000 acres that threatened to burn into this evacuated town, a fire official said.

Before they came together, the fires had destroyed about 185 homes elsewhere in the highlands of eastern Arizona, and as many as 25,000 people had fled more than half a dozen towns, including Show Low.

Having a merged fire makes in easier to fight in one respect, said Larry Humphrey, the fire incident commander.

"Before we couldn't put people in the middle of this fire. With one perimeter it makes it a little simpler," Humphrey said.

On Sunday night, the fire remained outside Show Low, though a few spot fires had been reported on the western part of town, he said.

Officials had initially said they expected the fire to enter the town about mid-afternoon.

"We were just lucky," said Humphrey. "We ran a lot of retardant on it. It's sitting, waiting on us."

Trees could be seen exploding into flame on the western horizon, and three or four slurry bombers dipped low behind trees, making several passes. Several brown columns of smoke swirled in the air. The

See **FIRES,** *A-6*

City tax penalties enforced unevenly

Private collectors not told of waivers

By Gordon Russell
Staff writer

When he decided to crack down on deadbeat taxpayers, former Mayor Marc Morial hired a private partnership to handle collections. Together, they adopted a no-exceptions policy that hit late payers with a 30 percent fine that the private group got to keep as its fee.

With such a hefty penalty being applied by a private firm, Morial reasoned, who-you-know politics would go out with the trash, and tax collections would increase.

But city documents show that exceptions were granted to many people diligent and informed enough to pursue them. Further, the politically con-

See **TAXES,** *A-4*

Washing away

How south Louisiana is growing more vulnerable to a catastrophic hurricane

PART TWO OF A FIVE-PART SERIES

The Big One

A major hurricane could decimate the region, but flooding from even a moderate storm could kill thousands. **It's just a matter of time.**

STAFF FILE PHOTO BY G.E. ARNOLD

FILLING THE BOWL • Many New Orleanians remember how Hurricane Betsy, above, inundated the 9th Ward. Yet under the right conditions, even a weaker storm could leave parts of New Orleans under as much as 20 feet of water for months.

Stories by John McQuaid and Mark Schleifstein Staff writers
Graphics by Daniel Swenson Staff artist

THE line of splintered planks, trash and seaweed scattered along the slope of New Orleans' lakefront levees on Hayne Boulevard in late September 1998 marked more than just the wake of Hurricane Georges. It measured the slender margin separating the city from mass destruction.

The debris, largely the remains of about 70 camps smashed by the waves of a storm surge more than 7 feet above sea level, showed that Georges, a Category 2 storm that only grazed New Orleans, had pushed waves to within a foot of the top of the levees.

A stronger storm on a slightly different course — such as the path Georges was on just 16 hours before landfall — could have realized emergency officials' worst-case scenario: hundreds of billions of gallons of lake water pouring over the levees into an area averaging 5 feet below sea level with no natural means of drainage.

That would turn the city and the east bank of Jefferson Parish into a lake as much as 30 feet deep, fouled with chemicals and waste from ruined septic systems, businesses and homes. Such a flood could trap hundreds of thousands of people in buildings and in vehicles. At the same time, high winds and tornadoes would tear at everything left standing. Between 25,000 and 100,000 people would die, said John Clizbe, national vice president for disaster services with the American Red Cross.

"A catastrophic hurricane represents 10 or 15 atomic bombs in terms of the energy it releases," said Joseph Suhayda, a Louisiana State University engineer who is studying ways to limit hurricane damage in the New Orleans area. "Think about it. New York lost two big buildings. Multiply that by 10 or 20 or 30 in the area impacted and the people lost, and we know what could happen."

See **CATASTROPHE,** *A-7*

INSIDE

RECALLING GEORGES
'98 was the most recent brush with a major storm.
SEE A-10

LEFT BEHIND
Geography and a lack of escape routes and public transportation limit evacuation options.
SEE A-11

TUESDAY

COST OF EXPOSURE
Even in the absence of a big storm, the rising risk of hurricane damage is making it increasingly expensive to live and do business along the coast.

MIDEAST IN CRISIS

Israelis surround Arafat's offices

Move widens control of Palestinian areas

By Yoav Appel
Associated Press writer

JERUSALEM — Israeli tanks entered Ramallah and surrounded Yasser Arafat's shell-shattered compound early today while the Palestinian leader and his aides were inside, expanding Israel's control over the West Bank.

Seventeen tanks were taking up positions all around Arafat's compound and just inside at a helicopter pad. Israeli soldiers flashed V-for-victory signs while standing atop their moving vehicles. Palestinian intelligence officials said 130 tanks were seen moving into Ramallah.

Yasser Arafat
'This situation is very serious and difficult.'

Two Israeli helicopters covered the incursion from above, but there was no resistance.

The Israeli army spokesman's office confirmed its forces had taken up positions in "strategic points in the city" of Ramallah and placed it under curfew. Some explosives were set off targeting the forces, the army said, slightly injuring one soldier. The army gave no further details, but three explosions were heard in the nearby al-Amari refugee camp.

The move into Ramallah widens the Israeli military's scope of control over once-autonomous Palestinian areas. Israeli troops now control most Palestinian population centers in the West Bank, including Nablus, Jenin, Tulkarem and Bethlehem.

Israeli forces began reinvading Palestinian towns when back-to-back suicide bombings Tuesday and Wednesday killed 26 Israelis in Jerusalem. The attacks prompted an Israeli policy shift to gradually retaking land with no plans to leave until all Palestinian terror attacks stop. More than a half-million Palestinians are confined under curfews.

Moments before the Israeli incursion today, word emerged that Palestinian authorities had placed the spiritual leader of the Islamic militant group Hamas

See **MIDEAST,** *A-6*

► **Bush may outline Mideast plan today, A-3**

STAFF PHOTO BY ELIOT KAMENITZ

GIRL, 4, DROWNS
Alphonse Schwartz walks with police officers after the body of his daughter, Cynthia Schwartz, was found Sunday in Lake Pontchartrain at the South Shore Harbor Marina. **See story, Metro**

Swimming safety concerns rise

Levee Board to review how to police lake

By Tara Young
Staff writer

In the wake of recent drownings on Lake Pontchartrain's south shore, the Orleans Levee Board is re-examining its role in policing swimmers, who are currently ignoring signs warning to stay out of the water.

"How do you stop them? How do you protect them from themselves?" said Jim Huey, Orleans Levee Board president.

When the lake was closed to swimming because of pollution hazards in the 1970s, the board shifted its focus from water safety, reduced its police force and dissolved its diving team to save money. But as the lake has regained its health and more people have returned to swim, the district has said it wants to provide organized, safe access.

The Levee Board has asked Carlton Dufrechou, executive di-

See **DROWN,** *A-5*

WASHING AWAY

BETSY'S LEGACY

For many New Orleanians, Hurricane Betsy is the closest thing to The Big One to hit. The 1965 hurricane sent an 8- to 10-foot storm surge through New Orleans, creating a lake 7 to 15 feet deep and stretching east from the Industrial Canal to the Gulf of Mexico. Thousands sought refuge in attics and on rooftops. St. Bernard and Plaquemines parishes were even harder hit. The National Guard moved in to stop looting, and President Lyndon Johnson came to view the wreckage. Afterward, massive levee-building and levee-improvement projects picked up steam.

High winds from Hurricane Betsy knocked down walls and roofs and pushed many houses, such as this one in the 3800 block of Laurel Street, off their piers.

STAFF FILE PHOTO BY G.E. ARNOLD

STAFF FILE PHOTO BY G.E. ARNOLD

Hurricane Betsy lifted the roof from this building and deposited it on top of a car on Burgundy Street. The storm pushed a wall of water up the Industrial Canal, flooding the 9th Ward and St. Bernard Parish.

STAFF FILE PHOTO

St. Peter's Catholic Church in the Reserve community of St. John the Baptist Parish was almost completely destroyed during the storm that hit early on Sept. 10, 1965.

A car sits submerged in the driveway of a home in the 6800 block of North Claiborne. The 9th Ward was especially hard hit in New Orleans, and much of Arabi and Chalmette were also inundated with up to 12 feet of water.

STAFF FILE PHOTO BY G.E. ARNOLD

Rescue workers paddle down St. Claude Avenue. After carrying their families to safety, some boat owners returned to pick up neighbors, drop them off on high ground and return for others who were waiting out the storm on their rooftops. After the hurricane, efforts were redoubled to raise and strengthen levees at the lower end of Plaquemines Parish and to drive steel sheeting behind the Industrial Canal levee to prevent a recurrence of the disaster.

STAFF FILE PHOTO

Swampy hell foreseen for those who remain in N.O.

CATASTROPHE, *from A-1*

Hundreds of thousands would be left homeless, and it would take months to dry out the area and begin to make it livable. But there wouldn't be much for residents to come home to. The local economy would be in ruins.

The scene has been played out for years in computer models and emergency-operations simulations. Officials at the local, state and national level are convinced the risk is genuine and are devising plans for alleviating the aftermath of a disaster that could leave the city uninhabitable for six months or more. The Army Corps of Engineers has begun a study to see whether the levees should be raised to counter the threat. But officials say that right now, nothing can stop "the big one."

Like coastal Bangladesh, where typhoons killed 100,000 and 300,000 villagers, respectively, in two horrific storms in 1970 and 1991, the New Orleans area lies in a low, flat coastal area. Unlike Bangladesh, New Orleans has hurricane levees that create a bowl with the bottom dipping lower than the bottom of Lake Pontchartrain. Though providing protection from weaker storms, the levees also would trap any water that gets inside — by breach, overtopping or torrential downpour — in a catastrophic storm.

"Filling the bowl" is the worst potential scenario for a natural disaster in the United States, emergency officials say. The Red Cross' projected death toll dwarfs estimates of 14,000 dead from a major earthquake along the New Madrid, Mo., fault, and 4,500 dead from a similar catastrophic earthquake hitting San Francisco, the next two deadliest disasters on the agency's list.

The projected death and destruction eclipse almost any other natural disaster that people paid to think about catastrophes can dream up. And the risks are significant, especially over the long term. In a given year, for example, the corps says the risk of the lakefront levees being topped is less than 1 in 300. But over the life of a 30-year mortgage, statistically that risk approaches 9 percent.

See **CATASTROPHE,** *A-8*

One direct hit could equal 15 atomic bombs

CATASTROPHE, *from A-7*

In the past year, Federal Emergency Management Agency officials have begun working with state and local agencies to devise plans on what to do if a Category 5 hurricane strikes New Orleans.

Shortly after he took office, FEMA Director Joe Allbaugh ordered aides to examine the nation's potential major catastrophes, including the New Orleans scenario.

"Catastrophic disasters are best defined in that they totally outstrip local and state resources, which is why the federal government needs to play a role," Allbaugh said. "There are a half-dozen or so contingencies around the nation that cause me great concern, and one of them is right there in your back yard."

In concert with state and local officials, FEMA is studying evacuation procedures, post-disaster rescue strategies, temporary housing and technical issues such as how to pump out water trapped inside the levees, said Michael Lowder, chief of policy and planning in FEMA's Readiness, Response and Recovery directorate. A preliminary report should be completed in the next few months.

Louisiana emergency management officials say they lobbied the agency for years to study how to respond to New Orleans' vulnerability, finally getting attention last year.

With computer modeling of hurricanes and storm surges, disaster experts have developed a detailed picture of how a storm could push Lake Pontchartrain over the levees and into the city.

"The worst case is a hurricane moving in from due south of the city," said Suhayda, who has developed a computer simulation of the flooding from such a storm. On that track, winds on the outer edges of a huge storm system would be pushing water in Breton Sound and west of the Chandeleur Islands into the St. Bernard marshes and then Lake Pontchartrain for two days before landfall.

"Water is literally pumped into Lake Pontchartrain," Suhayda said. "It will try to flow through any gaps, and that means the Inner Harbor Navigation Canal (which is connected to Breton Sound by the Mississippi River-Gulf Outlet) and the Chef Menteur and the Rigolets passes.

"So now the lake is 5 to 8 feet higher than normal, and we're talking about a lake that's only 15 or 20 feet deep, so you're adding a third to a half as much water to the lake," Suhayda said. As the eye of the hurricane moves north, next to New Orleans but just to the east, the winds over the lake switch around to come from the north.

"As the eye impacts the Mississippi coastline, the winds are now blowing south across the lake, maybe at 50, 80, 100 mph, and all that water starts to move south," he said. "It's moving like a big army advancing toward the lake's hurricane-protection system. And then the winds themselves are generating waves, 5 to 10 feet high, on top of all that water. They'll be breaking and crashing along the sea wall."

Soon waves will start breaking over the levee.

"All of a sudden you'll start seeing flowing water. It'll look like a weir, water just pouring over the top," Suhayda said. The water will flood the lakefront, filling up low-lying areas first, and continue its march south toward the river. There would be no stopping or slowing it; pumping systems would be overwhelmed and submerged in a matter of hours.

"Another scenario is that some part of the levee would fail," Suhayda said. "It's not something that's expected. But erosion occurs, and as levees broke, the break will get wider and wider. The water will flow through the city and stop only when it reaches the next higher thing. The most continuous barrier is the south levee, along the river. That's 25 feet high, so you'll see the water pile up on the river levee."

As the floodwaters invade and submerge neighborhoods, the wind will be blowing at speeds of at least 155 mph, accompanied by shorter gusts of as much as 200 mph, meteorologists say, enough to overturn cars, uproot trees and toss people around like dollhouse toys.

> "Think about it. New York lost two big buildings. Multiply that by 10 or 20 or 30 in the area impacted and the people lost, and we know it could happen."
>
> JOSEPH SUHAYDA
> Louisiana State University engineer studying ways to limit hurricane damage in the New Orleans area

The wind will blow out windows and explode many homes, even those built to the existing 110-mph building-code standards. People seeking refuge from the floodwaters in high-rise buildings won't be very safe, recent research indicates, because wind speed in a hurricane gets greater with height. If the winds are 155 mph at ground level, scientists say, they may be 50 mph stronger 100 feet above street level.

Buildings also will have to withstand pummeling by debris picked up by water surging from the lakefront toward downtown, with larger pieces acting like battering rams.

Ninety percent of the structures in the city are likely to be destroyed by the combination of water and wind accompanying a Category 5 storm, said Robert Eichorn, former director of the New Orleans Office of Emergency Preparedness. The LSU Hurricane Center surveyed numerous large public buildings in Jefferson Parish in hopes of identifying those that might withstand such catastrophic winds. They found none.

Amid this maelstrom, the estimated 200,000 or more people left behind in an evacuation will be struggling to survive. Some will be housed at the Superdome, the designated shelter in New Orleans for people too sick or infirm to leave the city. Others will end up in last-minute emergency refuges that will offer minimal safety. But many will simply be on their own, in homes or looking for high ground.

Thousands will drown while trapped in homes or cars by rising water. Others will be washed away or crushed by debris. Survivors will end up trapped on roofs, in buildings or on high ground surrounded by water, with no means of escape and little food or fresh water, perhaps for several days.

"If you look at the World Trade Center collapsing, it'll be like that, but add water," Eichorn said. "There will be debris flying around, and you're going to be in the water with snakes, rodents, nutria and fish from the lake. It's not going to be nice."

Mobilized by FEMA, search and rescue teams from across the nation will converge on the city. Volunteer teams of doctors, nurses and emergency medical technicians that were pre-positioned in Monroe or Shreveport before the storm will move to the area, said Henry Delgado, regional emergency coordinator for the U.S. Public Health Service.

But just getting into the city will be a problem for rescuers. Approaches by road may be washed out.

"Whether or not the Airline Highway bridge across the Bonnet Carre Spillway survives, we don't know," said Jay Combe, a coastal hydraulic engineer with the corps. "The I-10 bridge (west of Kenner) is designed to withstand a surge from a Category 3 storm, but it may be that water gets under the spans, and we don't know if it will survive." Other bridges over waterways and canals throughout the city may also be washed away or made unsafe, he said. In a place where cars may be useless, small boats and helicopters will be used to move survivors to central pickup areas, where they can be moved out of the city. Teams of disaster mortuary volunteers, meanwhile, will start collecting bodies. Other teams will bring in temporary equipment and goods, including sanitation facilities, water, ice and generators. Food, water and medical supplies will be airdropped to some areas and delivered to others.

Stranded survivors will have a dangerous wait even after the storm passes. Emergency officials worry that energized electrical wires could pose a threat of electrocution and that the floodwater could become contaminated with sewage and with toxic chemicals from industrial plants and backyard sheds. Gasoline, diesel fuel and oil leaking from underground storage tanks at service stations may also become a problem, corps officials say.

A variety of creatures — rats, mice and nutria, poisonous snakes and alligators, fire ants, mosquitoes and abandoned cats and dogs — will be searching for the same dry accommodations that people are using.

Contaminated food or water used for bathing, drinking and cooking could cause illnesses including salmonella, botulism, typhoid and hepatitis. Outbreaks of mosquito-borne dengue fever and encephalitis are likely, said Dr. James Diaz, director of the department of public health and preventive medicine at LSU School of Medicine in New Orleans.

"History will repeat itself," Diaz said. "My office overlooks one of the St. Louis cemeteries, where there are many graves of victims of yellow fever. Standing water in the subtropics is the breeding ground for mosquitoes."

Herculean pumping task

It probably will be at least four days after the hurricane before the corps attempts to begin removing water from the city, Combe said. After a 1947 hurricane flooded the east bank, it took several days for the lake to return to its normal average 14-foot depth, slowing efforts to drain floodwaters from Metairie and Kenner.

Pumping won't be an option. Swamped existing pumping systems in Orleans and Jefferson will be useless. Pumps can be brought in, but their capacity is limited.

"If one goes to construction equipment rental firms, you can rent pumps with a capacity of 6,000 to 8,000 gallons a minute, but that's just not enough capacity," Combe said. "After Betsy the corps employed six dredges with a combined capacity of 243,000 gallons per minute. It would take 44 hours to drain a half-inch of water from the New Orleans metro area that way."

The most likely alternative is simply blowing holes in the levees or widening existing breaches. Breaches in the levee totaling a half mile would allow the water to drain in one day, Combe said. With a more modest effort, totaling 100 feet of openings, draining would take four weeks. If they do dynamite the levees, officials must also weigh the risk of another hurricane hitting in the short term against the urgency of getting the water out.

Water levels will drop only to the level of the lake, leaving areas lower than that with standing water that must be pumped out. Workers will then focus on restoring existing generators throughout the city that operate the pumping system.

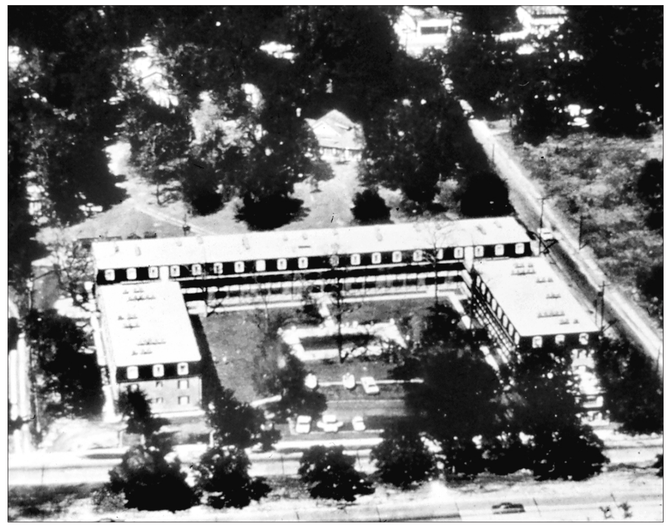
Harold Gorman, executive director of the Sewerage & Water Board, said his agency thinks it can get most of its pumps working in a month, based on its experience in Hurricane Betsy in 1965. But it may take longer than that just to get replacement parts for the various pumps and electric motors used in local drainage systems. "You've got a lot of apples and oranges out there," Combe said. "Sometimes it takes six months just to get parts. Sometimes there are no off-the-shelf parts available."

It will take six months to pump out Jefferson Parish, Combe said. But at that point, areas of New Orleans will probably still be underwater and may take many more months to empty.

Getting the water out is just the first step to making the city livable, officials say. "Imagine the city of New Orleans closed for four to six months," said Jeffer-

See **CATASTROPHE,** *A-10*

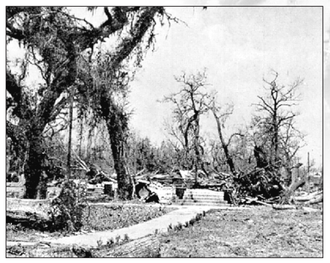
IN THE PATH OF CAMILLE



NOAA PHOTOS

THE RICHELIEU APARTMENTS • In Pass Christian, Miss., more than two dozen people decided to ride out Hurricane Camille in the Richelieu Apartments. Mary Ann Gerlach and her husband were about to join 10 of their neighbors for a hurricane party on the third floor when the storm hit. "We heard an awful popping sound as the windows went," Gerlach says in her book, "Storm." "We held our shoulders to the bedroom door to try to keep the water from coming in. But in about five minutes the bed was floating halfway to the ceiling. You could feel the building swaying like we were in a boat." Gerlach says she was thrown from her window as Camille blasted ashore with a nearly 25-foot storm surge and more than 200-mph winds. She saw her husband drown in the water and watched as the apartment complex collapsed. Mary Ann Gerlach was found the next day in a treetop, five miles away. Although earlier accounts listed her as the apartments' only survivor, two others have since been identified.

Hurricane Camille was the most powerful storm to hit the Gulf Coast. Nowhere was its fury more evident than in Pass Christian, Miss., where a towering storm surge destroyed many landmarks on Aug. 17, 1969.



TRINITY EPISCOPAL CHURCH • Eleven parishioners who sought refuge in the church were killed when the storm hit. Camille's 24.6-foot storm surge destroyed the chapel, and officials later found the victims buried under tons of debris, where they had been huddling between pews.

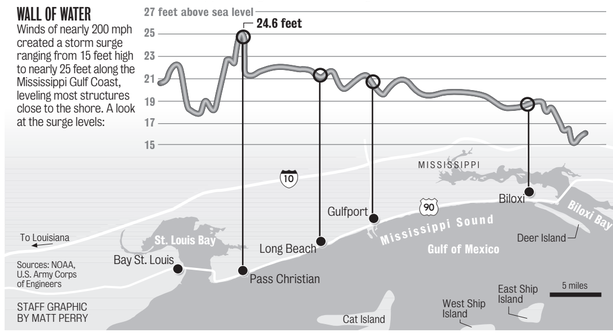
BARICEV'S SEAFOOD HARBOR • In 1965, Baricev's seafood restaurant, a longtime landmark on the Pass Christian waterfront, was destroyed during Hurricane Betsy. It was rebuilt, but four years later the restaurant fared no better during Camille, which again demolished the building.

JOHN HENDERSON HOUSE • The historic Pass Christian home had weathered all manner of storms for nearly 130 years before it met Camille. Only the front steps of the mansion, which had just been sold and was set to open in a few weeks as Coast Episcopal High School, remained after the storm.

CAMILLE'S FURY

Hurricane Camille, a Category 5 hurricane with winds of nearly 200 mph, hit Mississippi at 10:30 p.m. on Aug. 17, 1969. Camille caused 256 deaths from Mississippi to Virginia before moving out into the Atlantic Ocean.

WALL OF WATER
Winds of nearly 200 mph created a storm surge ranging from 15 feet high to nearly 25 feet along the Mississippi Gulf Coast, leveling most structures close to the shore. A look at the surge levels:



PATH OF DESTRUCTION

AFTER THE STORM

THE SCOURGE OF SURGE

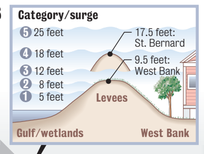
Storm surge is a dome of water accompanying a hurricane when it moves ashore. "The greatest potential for loss of life related to a hurricane is from the storm surge," says the National Hurricane Center's Brian Jarvinen. Louisiana's coastal wetlands and islands create friction that slows surge down, but they're eroding at an alarming rate. That leaves a system of levees as the area's last protection. A look at how storm surge from Category 3 and larger hurricanes can tower over levees.

1 CALM BEFORE THE STORM
Clear skies and beautiful weather often mask the choppy, rising waters created by ocean swells spawned in all directions by a hurricane days before it arrives.

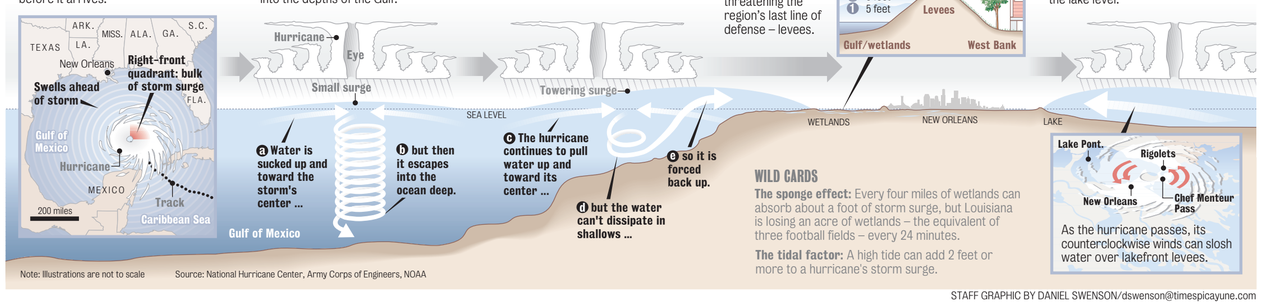
2 SURGE IN THE GULF
Over deep Gulf of Mexico waters, the hurricane's low air pressure and high winds pull the water up only a few feet before it is flushed into the depths of the Gulf.

3 SURGE COMING ASHORE
As the hurricane approaches land, the dome of water – 15 to 25 miles across – rises as high as 30 feet and is topped by violent waves.

4 TOPPING LEVEES
The giant wave moves over the shallow, eroding coastline, threatening the region's last line of defense – levees.



5 LAKE BACKLASH
In advance of the hurricane, easterly winds pump water into Lake Pontchartrain through the Chef Menteur and Rigolets passes, raising the lake level.



WILD CARDS

The sponge effect: Every four miles of wetlands can absorb about a foot of storm surge, but Louisiana is losing an acre of wetlands – the equivalent of three football fields – every 24 minutes.

The tidal factor: A high tide can add 2 feet or more to a hurricane's storm surge.

As the hurricane passes, its counterclockwise winds can slosh water over lakefront levees.

Note: Illustrations are not to scale Source: National Hurricane Center, Army Corps of Engineers, NOAA

STAFF GRAPHIC BY DANIEL SWENSON/dswenson@timespicayune.com

THREATENING SKIES

Although advanced warning systems have significantly reduced the loss of life from hurricanes, the costs in terms of destruction have jumped astronomically as coastal areas have become more developed. Here is a look at 12 notable storms that lashed Louisiana.

DAMAGE AMOUNTS ARE IN CURRENT DOLLARS

1893

UNNAMED
Landfall: Oct 1, 1893, at Grand Isle
Category: 2
Damages: $95 million
Deaths: 2,000
Winds: 100 mph
Storm surge: 15 feet

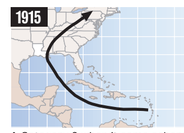
Many barrier islands were stripped of vegetation, and much of Grand Isle was destroyed. Waves at times washed over the Chandeleur Islands lighthouse, which stood 50 feet above sea level.

1909

UNNAMED
Landfall: Sept. 20, 1909, near Grand Isle
Category: 4
Damages: $114 million
Deaths: 353
Winds: 110 mph
Storm surge: 15 feet

Although only a Category 2 when it came ashore, storm surge inundated much of southern Louisiana.

1915



UNNAMED
Landfall: Sept. 29, 1915, in Grand Isle
Category: 4
Damages: $220 million
Deaths: 275
Winds: 130 mph*
Storm surge: 12 feet

A Category 2 when it came ashore, the storm flooded much of New Orleans, causing $85 million in damages in the city.

1947

UNNAMED
Landfall: Sept. 19, 1947, near Venice
Category: 4
Damages: $873 million
Deaths: 51
Winds: 125 mph*
Storm surge: 15 feet

Although only a Category 1 when it came ashore in Louisiana, most of New Orleans was inundated, with much of Jefferson Parish under 6 feet of water.

1957

AUDREY
Landfall: June 27, 1957, at the Texas-Louisiana border
Category: 4
Damages: $939 million
Deaths: 526
Winds: 144 mph
Storm surge: 12 feet

Waves at Cameron Parish reached as high as 20 feet above the storm surge. On the night before landfall, crawfish were seen fleeing by the thousands from the marshes around Cameron.

1964

HILDA
Landfall: Oct. 2, 1964, in Salt Point
Category: 3
Damages: $295 million
Deaths: 39
Winds: 116 mph
Storm surge: Unknown

The Gulf invaded Cocodrie, about 25 miles south of Houma, up to a depth of nearly 8 feet

1965

BETSY
Landfall: Sept. 9, 1965, at Grand Isle
Category: 4
Damages: $7.7 billion
Deaths: 81
Winds: 125+ mph*
Storm surge: 16 feet

Unprecedented damage was reported by oil companies and public utilities. After New Orleans experienced its worst flooding in decades, levees were raised by 2 feet. Nearly 300 miles away in Monroe, winds exceeded 60 mph. Third-costliest storm in the United States, after Andrew (1992) and Hugo (1989).

1969

CAMILLE
Landfall: Aug. 17, 1969, in Pass Christian, Miss.
Category: 5
Damages: $6.9 billion
Deaths: 262
Winds: 190 mph
Storm surge: 25 feet

The second-most intensive storm and the 10th-costliest to hit the United States. Although Mississippi took the brunt of the storm, Venice to Buras saw almost total destruction as Category 5 winds of 160 mph hit lower Plaquemines.

1985

DANNY, ELENA, JUAN
Landfall: Between Aug. 15-Oct. 27, 1985, striking at Pecan Island; near the mouth of the river; and near Bayou Lafourche
Category: All 1
Damages: $4.1 billion
Deaths: 19
Winds: varied
Storm surge: 8 feet (Danny and Juan), 10 feet (Elena)

The state suffered through three hurricanes in 1985. Juan caused heavy damage due to flooding, topping levees in Lockport, Marrero, Westwego and Myrtle Grove.

1992

ANDREW
Landfall: Aug. 24, 1992, on northern tip of Key Largo, Fla.
Category: 4
Damages: $37.5 billion
Deaths: 40
Winds: 145 mph
Storm surge: 17 feet (9 feet in Louisiana)

Weakened to Category 3 by the time it hit two days later at Point Chevreuil in Louisiana. About 1.5 million people evacuated south Louisiana. The costliest storm in U.S. history, with about $1.2 billion in damage in Louisiana.

*Gust recorded in New Orleans.

Sources: Unisys Corp., National Hurricane Center, Sun-Sentinel, staff research

STAFF GRAPHIC BY DANIEL SWENSON/dswenson@timespicayune.com

Tammany, West Bank spared from heavy flood

CATASTROPHE, *from A-9*

son Parish Emergency Preparedness Director Walter Maestri. "We'll have to re-evaluate all our sanitary systems, completely evaluate the water and purification systems, evaluate half to two thirds of all buildings to see if they were structurally damaged by water pressure and wind. Restoring electricity will be another complicated problem. Will houses catch fire when they throw the power switch? All that's going to have to be handled."

With few homes left undamaged, Red Cross and FEMA officials will have to find property for long-term temporary housing for a possible 1 million refugees. After Hurricane Andrew, some of the 250,000 residents of south Miami-Dade County forced to find temporary housing remained in federally financed mobile homes for 2½ years.

"You'd have manufactured housing brought in and set up in Baton Rouge and Folsom and so forth," Maestri said. "It's going to have to be north of Mandeville and Covington, because they're probably going to have hurricane damage as well. They'll probably use military bases like Camp Shelby in Mississippi, too. They'll be urban refugee centers, where people will stay while officials do an analysis to say, 'Yes, you can come back' or 'No, you can't come back here.' "

New Orleans would face the future with most of its housing stock and historic structures destroyed. Hotels, office buildings and infrastructure would be heavily damaged. Tens of thousands of people would be dead and many survivors homeless and shellshocked. Rebuilding would be a formidable challenge even with a generous federal aid package.

"You wouldn't have an infrastructure, that's for sure," said Hucky Purpera, natural and technical hazards chief for the Louisiana Office of Emergency Preparedness. "What would you be going back to? Residents might be going back in, but would businesses rebuild? They'll make decisions based on what's best for the company. And if you do decide to rebuild, do you rebuild there? A lot of that we don't know."

Still home sweet home?

But it's unlikely the city would be completely abandoned, economists and disaster experts say. Most cities do eventually recover from major disasters — though no precedent exists for the wholesale destruction of "filling the bowl."

No single storm would wipe out the entire New Orleans area. If the east bank floods, the west bank and St. Tammany Parish would take heavy damage from wind but be spared heavy storm-surge flooding. The city's location on the Mississippi River near the Gulf of Mexico would still be strategic for trade. Industrial plants upriver would remain largely intact.

"It's always recoverable. People own that property. They are not going to walk away. If someone does walk away, there will be a bank that will foreclose and ultimately resell that space," said Mary Comerio, a professor of architecture at the University of California, Berkeley, and author of a book on postdisaster reconstruction. "It will all be at fire-sale prices, and it will end up a different place, owned by different people."

After a Category 4 hurricane destroyed Galveston, Texas, in 1900, the entire island was raised 7 feet before rebuilding began. To avoid a repeat catastrophe, officials would likely consider how to hurricane-proof the city, or even think about moving it.

"We've not tried to tackle that yet," said Lowder, the FEMA official. "What's the best way to — I won't say rebuild — but where do we go from here? How can we make sure that our recovery doesn't put things back the exact same way they were?"

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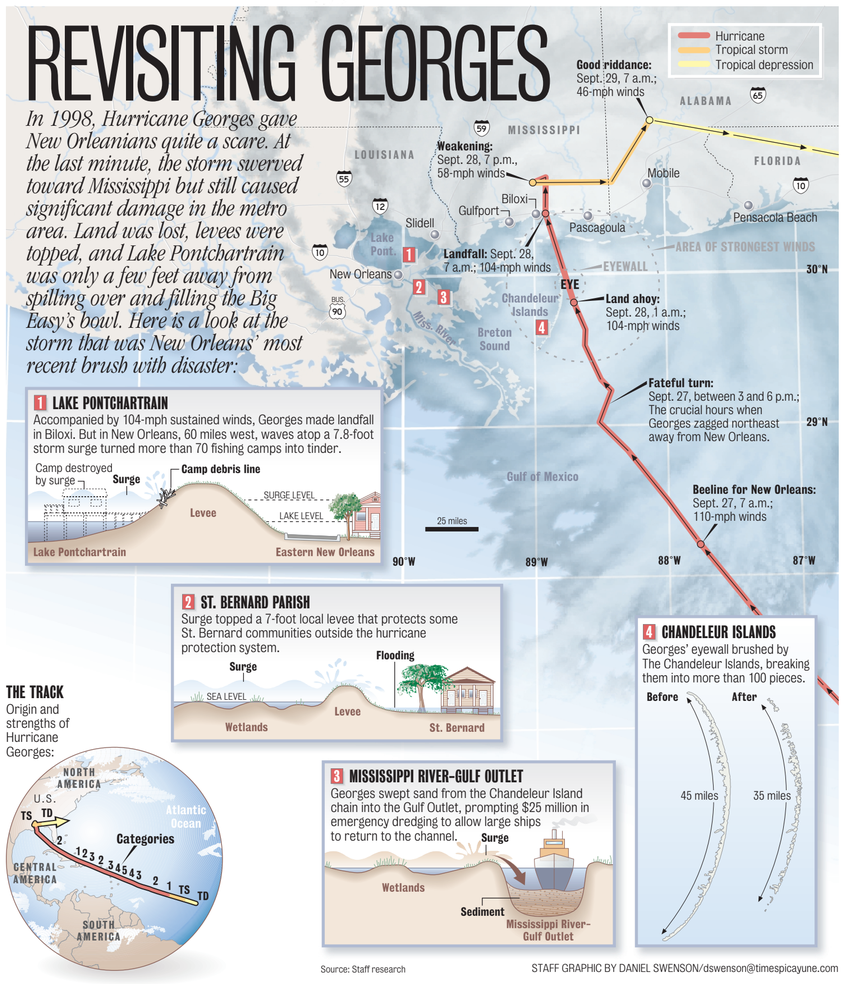


STAFF FILE PHOTO BY JENNIFER ZDON

Even though Hurricane Georges was considered a near miss, it made its fury known in New Orleans. The hardest hit areas were St. Bernard Parish and along Lake Pontchartrain in eastern New Orleans, where about two dozen fishing camps were destroyed by the storm in September 1998. Here, Blayke Badeaux, 10, walks over a pile of lumber and debris that used to be his uncle's fishing camp.

STAFF FILE PHOTO BY RUSTY COSTANZA

Hurricane Georges pushed an 8.5-foot storm surge through marshland in St. Bernard Parish, topping the 6-foot levee circling the community of Florissant. Water rose 8 to 10 feet in some parts of the parish, and 17 families were left homeless.

STAFF FILE PHOTO BY RUSTY COSTANZA

A storm surge produced by Hurricane Georges left some evacuation routes underwater in September 1998. Bayou Road near Florissant Highway in St. Bernard Parish was under nearly 3 feet of water.

Left behind

Once it's certain a major storm is about to hit, evacuation offers the best chance for survival. But for those who wait, getting out will become nearly impossible as the few routes out of town grow hopelessly clogged. **And 100,000 people without transportation will be especially threatened.**

By John McQuaid and Mark Schleifstein
Staff writers

HURRICANE evacuations rarely go as planned. Storm tracks are hard to predict, and roads are not designed to handle the traffic flow, so huge traffic jams are a common result. In 1998 it took six hours for people leaving the New Orleans area in advance of Hurricane Georges to reach Baton Rouge, 80 miles away. The following year, Hurricane Floyd's constantly changing course spurred evacuations and bumper-to-bumper traffic on highways from Florida to North Carolina.

Moving entire populations out of harm's way is a time-consuming and unpredictable operation complicated by geography, demographics, human psychology, the limits of weather forecasting, and transportation problems that tie many cities in knots even in perfect weather.

Like every coastal area vulnerable to hurricanes, south Louisiana faces these challenges. But the Louisiana delta also has it worse than other coastal areas.

Because the entire region is susceptible to storm-surge flooding, hurricanes pose more danger to those left behind than in places where the coastal profile is higher.

"Evacuation is what's necessary: evacuation, evacuation, evacuation," Jefferson Parish Emergency Preparedness Director Walter Maestri said. "We anticipate that (even) with refuges of last resort in place, some 5 (percent) to 10 percent of the individuals who remain in the face of catastrophic storms are going to lose their lives."

The region's sinking coast and rising flood risk also make the task of getting people out harder than it is elsewhere. South Louisiana presents some of the most daunting evacuation problems in the United States because:

▶ The region's large population, including more than 1 million people in the New Orleans area, requires a 72- to 84-hour window for evacuation, well ahead of the time that forecasters can accurately predict a storm's track and strength.

▶ Few north-south escape routes exist to move residents away from the coast, and many of those include low-lying sections that can flood days before a hurricane makes landfall.

▶ Evacuees must travel more than 80 miles to reach high ground, meaning more cars on the highways for a longer time as the storm approaches.

▶ A large population of low-income residents do not own cars and would have to depend on an untested emergency public transportation system to evacuate them.

▶ Much of the area is below sea level and vulnerable to catastrophic flooding. Based on the danger to refugees and workers, the Red Cross has decided not to operate shelters south of the Interstate 10-Interstate 12 corridor, leaving refuges of last resort that offer only minimal protection and no food or bedding.

Emergency officials say they have made improvements since Hurricane Georges, but the changes have yet to be tested under real-world conditions, and many obstacles remain.

Efficient evacuation key to survival

The predicament of the New Orleans area is part of a growing problem along the Gulf and Atlantic coasts. Hurricane evacuation planning and storm forecasting are better than they've ever been, but population growth, expanding development and coastal erosion are outpacing the gains, putting more people in danger and making it harder to move them out of the way.

Coastal areas across the United States have population densities five times the nation's average, according to the National Oceanic and Atmospheric Administration. About 50 percent of the nation lives within 50 miles of a coast, and that population is expected to continue growing.

The population and geographic pressures have forced emergency officials to take a harder look at the prospects for disaster. Two decades ago, few cities had evacuation plans. Now most coastal counties in the southeastern United States have comprehensive playbooks that choreograph the movements of vehicles and track the approach of high winds and storm surges down to the minute.

"Coastal populations have grown up dramatically, while road infrastructure relative to evacuation routes hasn't kept pace," said Louisiana State University assistant engineering professor Brian Wolshon, who studies the issue. "It wasn't that they didn't have plans in the past; it was that they weren't necessary. We needed plans adequate to deal with populations on the scale that we see now."

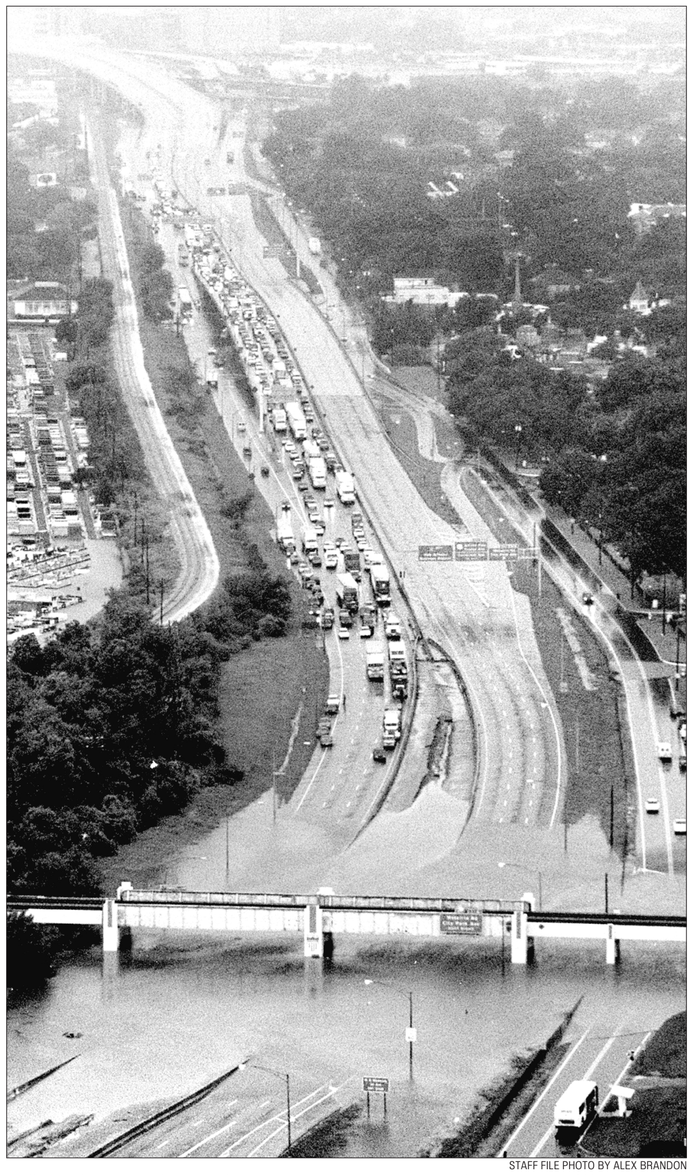
More lives depend on efficient and complete hurricane evacuations in the New Orleans area than anywhere else in the United States.

Unlike other vulnerable cities such as Miami, where high ground lies close to shore, south Louisiana lies at or below sea level and is at risk from storm surges that can suddenly catch people in fast-rising water that cuts off escape routes. Within New Orleans and parts of Jefferson Parish, the danger is even greater if a storm surge tops hurricane levees, a scenario that could kill tens of thousands of people.

For an evacuation of the New Orleans area to work, more than a million people have to travel at least 80 miles over an aging, low-capacity road system to reach high ground and shelter.

"In terms of what we call the safe zone, the I-10-I-12 corridor is roughly at a 25-foot contour line, which is the maximum storm-surge line," said state Department of Transportation and Development architect George Gele. "If you can get to the Interstate 10-12 corridor, you will be safe."

Of course, if everyone stopped there, those behind them would be stuck, and motels and housing are limited. Therefore, evacuation routes extend hundreds of miles north into Mississippi, up to Meridian and Jackson. During Hurricane Georges, thousands of Louisianians went as far north as Memphis, Tenn., and as far west as Dallas.



STAFF FILE PHOTO BY ALEX BRANDON

Traffic on I-10 westbound from New Orleans comes to a halt during Tropical Storm Frances in 1998 at the point where the interstate dips under a railroad trestle. The highway, a key evacuation route, drops 12 feet below sea level near the Orleans-Jefferson parish line. The state is installing a new pumping system to address the problem.

Time is of the essence

Forecasters cannot come close to predicting a storm's landfall accurately beyond 24 hours. Three days before a hurricane hits, the official forecast can be off by as much as 250 miles in either direction — the distance from New Orleans to a point between Pensacola and Panama City, Fla., to the east and Beaumont, Texas, to the west. That's a dramatic improvement from the 520-mile error rate of 30 years ago, but that advantage is partly negated by the larger populations that have to be evacuated.

Even 24 hours in advance, the average forecast error is about 85 miles, according to National Hurricane Center Director Max Mayfield, meaning 170 miles of coastline or more may be issued hurricane warnings at any one time.

"The decision-making and accounting for uncertainty in the forecast is the weakest link today on responding to hurricane threats," said Jay Baker, an associate professor of geology at Florida State University. "The earlier you start, the more uncertainty there is about where the storm is going to go, how severe it's going to be."

This creates a difficult situation for emergency managers. Delaying puts huge numbers of people at risk. Calling for an evacuation too early shuts down businesses needlessly, costing between $1 million and $50 million for every mile of coast evacuated, and possibly discourages people from leaving the next time.

"The effects on early evacuations due to false scares (are) so terribly important," said University of New Orleans sociologist Shirley Laska. "The lower parishes have grown to accept that," because evacuations occur so often, she said. But in the New Orleans area, people tend to be more skeptical, and false alarms compound that.

Evacuation times are squeezed even further because roads must be closed when the wind reaches gale force, from 39 to 54 mph, and it becomes unsafe to drive. At that point most hurricanes are just hours from landfall. Coastal erosion and sinking have created another problem. Some roads that didn't flood in the past now do, and those that flooded later now are underwater earlier.

"The last study done on the southeast area of the state used data from the late 1980s and was written in the early '90s," said Mike Brown, the state's deputy director of emergency preparedness. "I would not be surprised if the times (for evacuating safely) were to diminish on us as a result of the loss of wetlands."

Louisiana 1, for example, is the single escape route out of the lower reaches of Lafourche Parish and for thousands of workers on Gulf rigs based out of Port Fourchon. "Louisiana 1 is only a half foot above the normal summer high tide at the Leeville Bridge," said Windell Curole, general manager of the South Lafourche Levee District. "So, early in the ball game, Grand Isle, Port Fourchon and much of the rest of Lafourche Parish have to keep close track of storms."

With the threat of flooding and the potential for traffic jams, Curole and other officials fear the wrong set of circumstances could strand thousands of people in their cars in a powerful, fast-moving storm.

In New Orleans, another potential choke point looms. I-10 dips to 12

See **EVACUATION,** *A-12*

Funneling thousands out is a daunting task

EVACUATION, *from A-11*

feet below sea level under a railroad trestle near the Jefferson Parish line and floods in heavy rains. "If it floods, it severs the I-10 evacuation," Gele said. "That is a very fragile point. That is a very critical situation."

The state transportation department is installing a pumping system to address the problem.

Once people are on the road, the challenge is avoiding bottlenecks. I-10 is the only highway that runs all the way through the area, so plans call for evacuees to move east or west along it before they move away from the coast. Moving east, evacuees go up I-59 toward Hattiesburg, Miss. Those going west travel up I-55 toward the north shore and into Mississippi or continue along I-10 to western Louisiana and Texas. Evacuees also can leave by the Lake Pontchartrain Causeway, but it is usually the first major road to be shut down because of high winds.

Officials in Louisiana are negotiating with their Mississippi counterparts about how to run evacuations across the border. Mississippi officials fear that an evacuation of the New Orleans area, starting earlier than one on the more sparsely populated Mississippi coast, could clog the highways before their evacuation even begins, trapping people on the coast.

The lack of alternative escape routes extends the evacuation time, giving emergency planners less margin for error than their counterparts in areas with more routes or fewer people.

All lanes lead outward

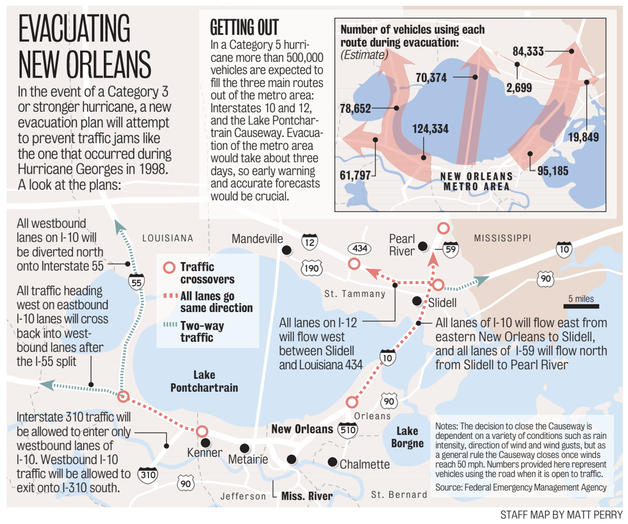
The biggest innovation in New Orleans since Georges is a plan to use "reverse laning," turning parts of I-10 into one-way thoroughfares to cut traffic jams and evacuation times and to maximize the number of people leaving. The state transportation department has built crossover lanes to move traffic out of the city one-way going west out of Kenner and one-way east beginning in eastern New Orleans. Mississippi officials have established similar crossovers on I-59 just north of the Louisiana state line and just south of Laurel.

The Louisiana transportation department also has upgraded its flood-monitoring system, called Hydrowatch, which takes information from 154 stations across the area and uploads it to a satellite. From there, the department can access the data and integrate it into a Web site so officials and residents can monitor flooding in real time and see which roads become impassable as the water rises. The site also shows evacuation routes and road closures.

Workers also are installing monitors along highways that use the same system to monitor both weather conditions and traffic. With the satellite monitoring, emergency managers will be able to keep track of traffic flow as it waxes and wanes during an evacuation and respond immediately if problems crop up.

The risk of dying is so high that trying to ride out a storm is foolish, emergency managers say. Yet for various reasons, many people do not leave. In New Orleans, many residents don't own cars. Some are unaware of the danger. Some think they can judge it for themselves. About 44 percent of Orleans residents and 52 percent of Jefferson residents evacuated during Georges, according to a University of New Orleans survey. A separate Jefferson Parish study estimated that 60 percent of residents left the parish.

"I don't have a question about the fact that a lot of people are not going to leave, not just the 100,000 who don't have private transportation," said Terry Tullier, acting director of New Orleans' Office of Emergency Preparedness. "We think we're going to do our people a terrible disservice if we don't tell them the truth. And the truth is that when it happens, a lot of people are going to die."



STAFF MAP BY MATT PERRY

> "A lot of people are not going to leave, not just the 100,000 who don't have private transportation. ... And the truth is that when it happens, a lot of people are going to die."
>
> TERRY TULLIER, acting director of New Orleans' Office of Emergency Preparedness

Those who remain should not expect to find safe shelter, officials say. Few buildings in the area can withstand the forces of a Category 4 or 5 hurricane. "We don't have structures that can handle wind and water at those velocities and at that water height," Maestri said.

Emergency officials once counted on "vertical evacuations" to tall buildings as a way to escape flooding. But Florida's experience with Hurricane Andrew in 1992 has scuttled that policy. Andrew's winds blew windows out of many skyscrapers and heavily damaged the upper floors of many tall buildings. In 1996, sophisticated instrument packages dropped into hurricanes confirmed that wind speeds can be 50 mph stronger several hundred feet above ground level.

"Before 1993 we thought we could evacuate vertically into high-rise buildings. But we can't do that because of what Hurricane Andrew did to Miami-Dade. Our building codes, our buildings, are not as strong as theirs," Maestri said.

Don't bank on shelters

The American Red Cross, which runs federally designated emergency shelters, changed its policy in the mid-1990s after a shelter in South Carolina flooded and people inside nearly drowned. Now the agency bars shelters in areas that can be inundated by a storm surge from a Category 4 hurricane — which is all of south Louisiana.

Local parishes plan to shelter only those with "special needs," people who cannot be moved. In New Orleans, the Superdome will be used for this purpose.

In lieu of traditional shelters, which offer food and bedding, some parishes plan to open "refuges of last resort" — buildings that are not safe but are safer than homes. They can house at most a few hundred people per parish, officials say. Most others will be on their own, meaning that in a catastrophic storm more than a 200,000 people could be left at the mercy of the elements.

Faced with those numbers, New Orleans officials have backup plans to move people without transportation: Regional Transit Authority buses and National Guard vehicles would take people out of the city. But the untested plan has raised serious questions from critics who say it could endanger hundreds of thousands of residents.

In an evacuation, buses would be dispatched along their regular routes throughout the city to pick up people and go to the Superdome, which would be used as a staging area. From there, people would be taken out of the city to shelters to the north.

Some experts familiar with the plans say they won't work.

"That's never going to happen because there's not enough buses in the city," said Charley Ireland, who retired as deputy director of the New Orleans Office of Emergency Preparedness in 2000. "Between the RTA and the school buses, you've got maybe 500 buses, and they hold maybe 40 people each. It ain't going to happen."

The plan has other potential pitfalls.

No signs are in place to notify the public that the regular bus stops are also the stops for emergency evacuation. In Miami Beach, Fla., every other bus stop sports a huge sign identifying it as a hurricane evacuation stop.

It's also unclear whether the city's entire staff of bus drivers will remain. A union spokesman said that while drivers are aware of the plan, the union contract lacks a provision requiring them to stay.

But RTA safety director Joseph Dorsey said the requirement is part of an operator's individual contract with the RTA. "Basically, when an operator is hired, there are certain things they agree to, such as working overtime hours when necessary and doing this job," Dorsey said. "They will participate."

A similar plan in Monroe County, Fla. — the Florida Keys — failed during Georges when drivers opted out. "The problem is that we may have the buses but we don't have the drivers," said Irene Toner, director of the county's emergency management office. "In Hurricane Georges we had 25 people on our bus-driver list and only five showed up."

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WASHING AWAY

After Hurricane Floyd inundated parts of North Carolina in 1999, thousands were left homeless.
Today, nearly three years later, some people are still living in temporary trailers.

Homes throughout Greenville, N.C., were inundated after the Tar River flooded during Hurricane Floyd. About 10,000 people were left homeless.

AP FILE PHOTO

Seeking shelter

By John McQuaid
Staff writer

ROCKY MOUNT, N.C.

GRIFFIN Clark's string of bad luck began when Hurricane Floyd flooded her out of her apartment in a small public housing development in Tarboro, N.C. Then an old foot injury acted up and she had to get orthopedic surgery. Unable to work for a time, she lost her job at an auto parts plant. Unable to pay the bills, she filed for bankruptcy. Amid the problems, she was unable to find a new place to live.

So for two years — long after Floyd had become just an unpleasant memory for most people — she stayed in a mobile home provided by the Federal Emergency Management Agency for storm refugees in Rocky Mount, about 20 miles west of Tarboro.

"It's not much, but it's home," she said, sitting on a couch and looking down at the tattered carpeting in the living room one day in November. "It's been rough being so far from my real home, my friends. I've been trying to get out, rent an apartment back in Tarboro. But there's no place to get out to."

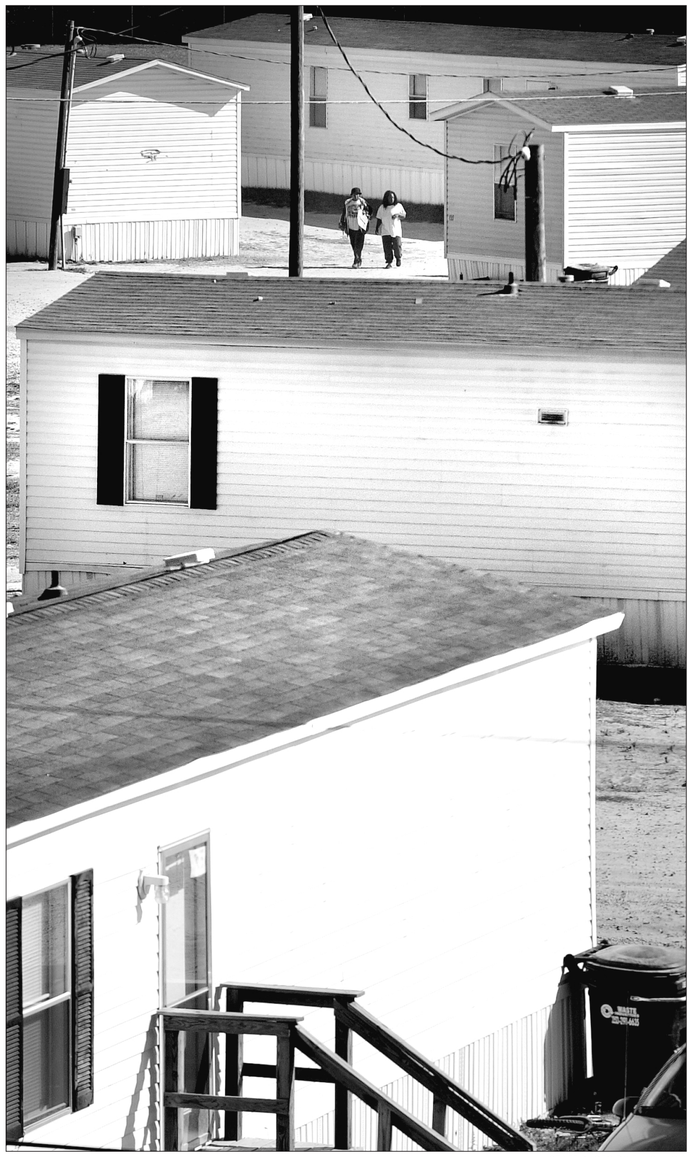
Clark finally moved out in March, 30 months after the hurricane struck. With help from a federal relief program, she bought one of the used FEMA mobile homes on a plot in a park once used for storm refugees, now converted to private use, just outside of Tarboro.

When a disaster wrecks homes, the federal government steps in with temporary housing, considered a last resort for those who cannot find anywhere else to stay. The idea is to provide basic shelter until homes can be repaired or rebuilt. But when the damaged buildings are public housing units and rental apartments occupied by poor people, owners or agencies may be slow to rebuild. They may never come back at all. With nowhere else to go, people with few financial resources can end up in temporary housing for a very long time.

North Carolina's post-Floyd problems with poverty and temporary housing give a hint of what New Orleans could face on a much larger scale if a catastrophic storm swamps the city. North Carolina's experiences also provide a rough road map of what emergency managers here would have to do to address the needs of newly homeless residents.

Based on the North Carolina example, the state and federal governments would end up running what would be the largest public housing program in the nation's history, allocating money and other resources to maintain large trailer and mobile home parks while waiting for inexpensive, alternative housing to be rebuilt in the city. That might not take place for years, if it occurs at all.

North Carolina's temporary housing program was supposed to shut down after 18 months. But it was extended twice, and 33 months later it is still operating after a second deadline expired. Officials had whittled the numbers down to 69 families at the start of June, and they are hoping to end the program this summer.



STAFF PHOTO BY ELLIS LUCIA

North Carolina officials had expected to shut down their temporary housing program after 18 months, but 33 months later, there are nearly 70 families still living in temporary housing, such as here in Princeville, N.C.

Flood leaves 10,000 homeless

North Carolina's 1999 deluge bears a rough resemblance to the "filling the bowl" scenario in New Orleans. The hurricane came on the heels of a tropical storm that dumped heavy rains and swelled local waterways. When Floyd strafed North Carolina — the worst hit among the East Coast states that were declared disaster areas — heavy rains, river flooding and a storm surge in coastal areas put 18,000 square miles of land under water. Dozens of towns were flooded, some for days, a few for weeks.

In Tarboro, "the roads filled up with water," Clark said. "There were frogs and snakes. I didn't have more than two days worth of clothes when we left. Water was coming up in the driveway. All we could see was water. It stayed up two to three weeks before we could get back in there. When we did, the whole apartment complex was flooded. What water didn't damage, mold got to. Steps collapsed. Everything was piled in the middle of the floor."

The hurricane's widespread flooding initially left more than 10,000 people homeless and heavily damaged 15,000 homes. If the levees are topped on the east bank of Orleans, Jefferson and St. Bernard parishes, by contrast, the disaster would be more confined geographically but would affect more people and structures. More than a 100,000 dwellings would be heavily damaged. Hundreds of thousands of people would initially be left homeless.

Days after Hurricane Floyd, after everyone stranded was rescued and the waters receded, North Carolina emergency managers realized they had no plans for how to handle the massive needs of the dispossessed. In spite of that handicap, they managed to mobilize fast. They formed an interagency committee to handle the response and manage the $1.3 billion in disaster aid that would soon be coming through. They hired Doug Boyd, an ex-Army major, to run the program. Workers fanned out to canvass possible locations to build temporary trailer parks, preferably as cheaply as possible. FEMA initially moved in more than 1,800 travel trailers and, more gradually, 475 mobile homes to accommodate the approximately 5,000 people — about 2,000 families — in need.

South Louisiana would require a more massive national mobilization of resources, one that might even stress national inventories of trailers and mobile homes. FEMA and state agencies would truck thousands of those housing units into the region from points across the United States. Officials working on catastrophic disaster planning are looking at where the units might go and say it might have to be far from New Orleans — rural Mississippi, for example, something that might put commuters in a bind or force some to quit jobs, if their jobs still exist.

'Little towns' spring up

North Carolina officials set up 11 parks for travel trailers and the more permanent mobile homes. Some ended up in remote rural areas, others on unused properties in industrial areas on the edge of small towns — generally, the least desirable spots around. "If you have to live in temporary housing, you can have it at three locations," Boyd said. "First, the best if you are the homeowner, put it on your own property. Second, a commercial site, a trailer park, close to your home. Third, group parks. For renters we had to build group parks."

Setting up and maintaining the parks was a complex job. It involved installing utilities, ensuring police protection and dealing with the needs of individual families.

"You're building little towns," Boyd said. "So you've got sewer, electrical stuff. You have to build the infrastructure before people can move in. We had to put everything in place — had to build mailboxes, hire a transportation company to bring buses to take people to the hospital, grocery stores or other places they need to go."

The parks were crowded and unpleasant places to live, residents say. Some liken them to Third World refugee camps. "It was kind of like living in a neighborhood, but noisy," said Theresa Richardson, who lived in a park with her family for more than a year. "You were compacted together; everyone could hear your conversations, people walking by at all hours of the night."

For a time police units were assigned to some of the parks around the clock because of rampant crime. "You bring so many people close together, you got problems: domestic disturbances, drugs, prostitution," said Stan Ballantine, who manages the Fountain Industrial Park site.

Stuck with administering these quasi-towns, officials worked to move people out and shut them down. But that work has been slow and arduous because of a lack of affordable housing units for the poor. The sparsely populated rural area never had a lot of rental housing units, and now it has fewer.

"Eight or nine family public housing complexes were destroyed as a result of Hurricane Floyd," said Eric Tolbert, the state director of emergency management. "In some cases the rebuilding process hasn't been started. Of those facilities there is only one that has started leasing, letting residents back in. . . . The procedure to go through and get approval to rebuild those units took a long time. With private rentals, owners are not, for whatever reason, going to rebuild it or don't want to lease to the tenant again."

New Orleans has 20,000 people living in public housing. In the wake of disaster, it's unclear how, or if, the federal government would move to redevelop the property immediately. Renters would also face an empty market at first, then one that might be rebuilt to suit the needs of those with higher incomes.

"Anywhere you have a relatively poor population, they are typically renters, so they have little control over whether places are rebuilt," said Betty Morrow, a sociologist

See **NORTH CAROLINA,** *A-14*